

## **Report #9**

### **Human Anatomy and Soft Tissue Injuries:**

The most common injury occurs from the bouncing around of a body in a vehicle. Often, a car occupant's neck "whips" back and forth, giving rise to what is known as an acceleration-deceleration injury, or the often maligned "whiplash."

In acceleration injury the head is put into motion from a stand still position, as a result of which the different layers of the brain travels at different velocities with shearing effects and rotation of the brain within the skull. This is seen in motor vehicles accidents where the car is hit from the back. In deceleration injury the head is brought to a stand still from a moving position as in falls. Since the head is a large weight on the neck, the neck takes the brunt of the force.

Frequently, the lower back is hurt, as well. Occasionally someone slams a knee into the dashboard or breaks a pinky, but these types of injuries are not common.

1. What is a "soft tissue" injury? Put simply, a soft tissue injury is one where no bones are broken. Soft tissue injury is the most common type of accident injury. Whiplash is one type of soft tissue injury. Often an accident victim can be badly hurt, but may not feel injury immediately. Some get gradually worse.
2. I've had clients come into my office after an accident, and they seemed pain-free, able to twist and bend, and converse with me easily. Then they get worse and worse and may need surgery. I've also had clients come in after an accident in great discomfort. Wearing one of those padded collars around their necks; having trouble sitting down in the chair in my office. Having trouble standing up. I've accepted cases like that and seen people get all better. The point is that you never know if you're going to heal. I don't know if you're going to

heal. Even the doctors don't really know if you're going to heal. Usually, only "time will tell."

3. Soft tissue injuries generally refer to the spine: the neck and back. The spinal cord is approximately 1½ feet long, round, slightly thicker than a pencil, and goes from the base of the brain to the tail bone (sacrum). It supports the body. In addition to allowing the body to remain upright and flex and twist, the spinal cord acts like a large electrical cable with smaller cables (nerves) running inside it, and branching out into the arms, legs and other parts of the body; imagine, if you will, a tree.
4. The spine is constructed of bones known as vertebrae. But if the spine was solid bone, it could not bend and twist. Therefore, in addition to being wrapped in muscles and ligaments and such, the bones or vertebrae are separated by, held together by, and sandwiched between, discs. These are soft, shock-absorber-like structures. Harder on the outside and softer on the inside; imagine, if you will, a jelly donut. Every spinal vertebra (bone) has a number, and the spinal discs each have two numbers – like an address – of the two vertebrae on either side of it. For example, the disc in the cervical spine (neck) between spinal vertebra C1 and spinal vertebra C2 is known as C1-C2.
5. The nerves run through and in and out of the spine. The nerves transmit nerve impulses (electrical-like signals) that move muscles in the body. Closest to the spine are the nerve roots.
6. Nerves and discs are the anatomical structures we most often refer to when discussing spinal injuries. Less frequently involved are ligaments and muscles. Ligaments are bands of tough tissue that connect bones and hold them in place. Ligaments generally get injured when stretched. This is called a "sprain"; which generally heals. Muscles move the spine.

## ***SOFT TISSUE INJURIES***

1. The holy grail of soft tissue injuries is the herniated disc. Its first cousin is the bulging disc. Simply put, a bulging disc injury occurs when the shape of the disc changes so that part of the disc bulges outside its usual boundaries between the spinal vertebrae. A herniated disc is more severe; the soft material inside the disc bulges out also, and may leak. Imagine, if you will, squeezing a jelly donut so that it starts to ooze. Note: Not all disc herniations hurt. And you can have pain without a disc herniation. Pain may come and go; many people have good days and bad days.
  
2. These types of injuries are bad for two reasons.
  - ▶ First, over time the injured disc can lose its flexibility and ability to cushion the spinal vertebrae. This could lead to rubbing and irritation, and maybe arthritis between the vertebrae. Very bad.
  
  - ▶ Second, the spine is a miracle of engineering – there’s not a lot of extra space anywhere. So a bulging or herniated disc frequently moves against something, and that something is commonly a nerve root. This can irritate the nerve root and prevent it from functioning correctly. In extreme cases the nerve root can die. This can lead to pain, numbness, muscle weakness and a host of other problems.
  
  - ▶ Another type of spinal nerve injury: through the spine’s movement and whipping back and forth the nerve root gets “pinched” by one of the anatomical structures next to it.

- ▶ These nerve injuries are sometimes referred to as radiculopathy or radiculitis.
3. An important concept when considering spinal injuries is “dermatomes.” This refers to the levels of the spine and nerves and what areas of the body they serve. For instance, the part of the spine closer to the head (commonly known as the cervical spine), has nerves that branch out and run into the shoulders, arms and fingers. Thus, a neck injury may lead to tingling or pain in your shoulder, arms, or fingers. A fracture of the spine at the cervical level that damages the spinal cord may cause a loss of function at or below that area. So that such an injury may cause paralysis of the arms and legs. The part of the spine closer to the tail bone (commonly known as the lumbar spine) has nerves that branch through your buttocks and down your legs to your feet. Thus a lumbar spine injury may lead to tingling or pain down your legs. A fracture of the lumbar spine may disable all the nerves beneath that level, so that a person might suffer paralysis and an inability to walk, but still have perfect arm and hand function.

## ***DIAGNOSTIC TOOLS***

Proving soft tissue injury to the satisfaction of a judge or jury or, more likely, an insurance company, is no simple matter. A person may legitimately hurt, but documenting the injury can be difficult and expensive. Without a fracture or broken bones, x-rays are of no use. They won't show soft tissue injury. Soft tissue injuries don't bleed (you can't put a band-aid on them).

The biggest problem is that soft tissue injuries have a bad reputation. They are easy to claim and hard to prove. It is easy for a healthy person to say, “My back hurts,” or “My neck hurts,” which is, unfortunately, too common. This makes it harder for persons actually injured to recover fair money damages. These injuries are also maligned in the press, often as part of insurance company



propaganda. We've all seen television exposés of persons claiming injuries that get caught on video tape doing heavy physical labor. Rarely do we see the person crippled by a soft tissue neck or back injury, who can't get just compensation, put food on the table or pay the rent.

**Here's a secret you should know:** Justice does not always prevail. The truth does not always win in court. If a lie is proven, a lie can win and an injured accident victim can lose!

### *How do we prove soft tissue injury?*

I told you that x-rays do not show soft tissue injury. However, they may show changes to the shape of the spine (which is bone) caused by muscle spasm. Generally, however, x-rays are of little use in showing soft tissue injury. A CT scan or CAT scan is a 3-D x-ray, and also of little use in diagnosing soft tissue injury.

Commonly used to show herniated or bulging discs is: Magnetic Resonance Imaging or MRI. Rather than using radiation, the MRI uses a magnetic field to show soft tissue – muscle, ligaments, and organs. Insurance companies do not like to pay for MRI testing, because it's expensive. **Here's a secret:** Some doctors like MRI tests because . . . they're expensive. Beware of medical facilities that over-test with MRI's following an accident. Some unscrupulous facilities will send an automobile accident patient for too, too many MRI's, for every imaginable body part. Insurance companies pick up on this rather quickly, and the damage to the reputation of that doctor or facility may hurt your lawsuit. On the other hand, if you have pain in your neck or back that doesn't go away, and especially if you have nerve-type shooting pains (remember: radiculopathy or radiculitis) you may want to make certain that your doctor does send you for an MRI of the affected body part. At the minimum, this is something that you may want to discuss with your physician.

**Another secret:** A problem with MRIs is that they are subject to interpretation. That means that one specialist (a radiologist) can read an MRI film and see a serious accident-related soft tissue injury while another radiologist – typically hired by an insurance company to defend a lawsuit – may see no injury, or an old, pre-existing injury, or nothing much at all: just degenerative changes due to the passage of time and wear-and-tear on the body, but nothing accident-related.

A test often used to test for nerve damage is the electromyogram (electromyography) or EMG test. Once you have an EMG test you won't forget it. The EMG requires insertion of needles into your muscles. EMG uses tiny electrical impulses to test for nerve root injury. It may not say why the nerve is injured – that comes from other tests and your doctor's clinical experience, as well as your medical history.

Other tests are range of motion (ROM) tests – the ability to move, bend or twist your neck or back and muscle strength studies. While low-tech and usually not involving the use of any special equipment, ROM tests have taken on great importance in the area of auto accident cases, as will be shown at greater length below.

Once these soft-tissue injuries are proven to exist, the next hurdle is proving they were caused by the accident, and not by some prior incident, accident, medical condition, or disease.

## ***TREATMENT***

### **What kind of treatment can you expect for your soft tissue injury?**

Common treatments:

- ◆ Traction.
- ◆ Physical therapy – applied stretching and strength-building exercises

- ◆ Cryotherapy: apply ice or cold
- ◆ Heat
- ◆ Massage
- ◆ Injections into points of spasm
- ◆ Low voltage electric stimulation
- ◆ Medication (muscle relaxers/anti-inflammatories)
- ◆ Biofeedback
- ◆ Conservative treatment - bed rest, analgesics, a cervical collar
- ◆ Chiropractic care: can include massage, heat, electrical stimulation, etc.
- ◆ Surgery: a last resort